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ABSTRACT

European studies that investigated motivational and contextual influences on students' approaches to learning are reviewed. The studies used both quantitative and qualitative methodologies. Both interviews with students and factor analysis of inventories have assessed deep and surface approaches to learning. In some studies, learning approaches in different academic disciplines and across a range of academic activities (e.g., reading, essay-writing) have been assessed. The inventories include the Approaches to Studying Inventory and the Inventory of Learning Processes. Findings of both qualitative and quantitative studies indicate that different forms of motivation are associated with the three main approaches to learning (deep, surface, and strategic). Intention and process in student learning seemed to be inseparable. Learning approach was strongly affected by assessment procedures, workload, freedom in learning, and by what students perceived to be good teaching. Definitions are provided for the following learning approaches and styles: deep approach, surface approach, strategic approach, comprehension learning style, and operation learning style. Exploration of students' perceptions of contextual influences on studying is recommended. (SW)

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APPROACHES TO LEARNING IN HIGHER EDUCATION: EFFECTS OF MOTIVATION AND PERCEPTIONS OF THE LEARNING ENVIRONMENT

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Approaches to learning in higher education: effects of motivation and perceptions of the learning ~~context~~ environment

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This article reviews a series of European studies using both quantitative and qualitative methodologies to investigate motivational and contextual influences on students' approaches to learning. Analysis of interviews, combined with factor analysis of inventories, emphasized the inseparability of intention and process in student learning. The findings indicate that different forms of motivation are associated with the three main approaches to learning (deep, surface and strategic). Approach is strongly affected by assessment procedures, workload, freedom in learning, and by what students perceive to be good teaching. It is argued that it is useful to explore students' perceptions of contextual influences on studying, and that qualitative methods play an important role in producing concepts with clear ecological validity in educational psychology. As the interplay between quantitative and qualitative methods features prominently in this research, the first section explains the rationale for this strategy.

Quantitative and Qualitative Methodologies

It was Cronbach (1957) who drew attention to the effects of having two research traditions in psychology co-existing but not communicating. The study of individual differences through survey methods had become separated from research into learning processes which used experiments in laboratory settings. There were, of course, other research methodologies also in

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existence at that time, with strong historical pedigrees, but out of favour with empirical researchers: they made use of clinical interviews and social anthropological observations. Since that time there has been a tendency for experimental techniques to be brought into natural settings in the pursuit of ecological validity (Neisser, 1976), and a growing recognition of the importance of individual perceptions of social environments (Magnusson,1984) and causal attributions (Hewstone, 1983) in understanding human behaviour. In educational research there has also been a wide variety of classroom studies using observation techniques (Delamont, 1976). These recent developments have drawn on differing data collecting techniques, but the continuing dominance of the survey and experimental traditions has meant that observation and introspection are still viewed with suspicion. As a result, qualitative techniques of data collection and analysis have been forced to develop largely in isolation from, and in opposition to, the mainstream methodologies.

The accepted research procedures emphasize the need to narrow the research problem, to derive a theoretical perspective from existing literature, to operationalize the constructs, to control the data-collection setting, and to seek generalizability through tests of statistical significance. Yet these techniques effectively remove the researcher from the world experienced by student and teacher, and create instead a microworld for academic disputation. Of course, there are important links between this microworld and the classroom, but the narrow focus of many research studies prevents their findings describing a 'recognizable reality' (Miller & Parlett, 1974) for the teacher. Qualitative research often relies on

techniques of grounded research (Glaser & Strauss, 1967) to identify explanatory concepts and descriptive categories from the data. And the categories themselves are often treated as the main findings of the research (Marton, 1981). Moreover, the insights that the participants reveal in open interviews often involve causal attributions which guide theory development. But above all, qualitative research allows the focus of research to remain broad, defining the research problem within its full social and personal context.

It is true that many quantitative studies begin with a qualitative phase of observations or interviews. But that phase is preliminary: its continuing influence is only through the operationalization of the constructs. In his more recent work on program evaluation, Cronbach (1982) has pointed out the value of using qualitative descriptions of variations in the implementation of innovations. This argument could be extended to apply more generally to educational psychology. In investigating learning in classroom settings, descriptions of qualitative differences in those settings may be as important as the analysis of relationships between psychological constructs.

The 'treatment' that is applied in real educational settings contains its own set of interacting variables: it cannot be encapsulated within a single variable. Magnusson (1984; Magnusson & Allen, 1983) has argued that there is an urgent need to develop effective conceptualization and categorization of situations, paralleling the way in which the main dimensions of individual differences were previously classified. He goes on to argue that behaviour depends not just on the situation, but on people's <u>perceptions</u> of that

situation, which in turn depend on more stable features of their personality.

> "When we describe ... current behaviour in terms of person-situation interaction processes ..., the problem is not how the person and the situation as two separate parts ... interact. It is, rather, ... how the individuals by their perceptions, thoughts, and feelings function in relation to the environment ... (including their) conceptions of the external world ... (and their) self-conceptions" (Magnusson, 1984, p. 231).

In the same way that experimental designs have been harnessed to survey methods in a.t.i. research, it is now necessary to see what progress can be made using these quantitative techniques in tandem with qualitative procedures (Entwistle, 1974). It was this argument which underpinned the design of a research program at Lancaster University, sponsored by the British Social Science Research Council,,to investigate student learning in a natural context by capitalizing on the strengths of both quantitative and qualitative methodologies. The results of this research provide the focus for the subsequent sections, presented alongside findings from European and Australian studies using similar conceptualizations and methodologies.

As the research has given equivalent weight to qualitative and quantitative methods, its presentation has to contain a similar balance in following formats appropriate to statistical and interpretative analyses.

Conceptualization of Motivation and Approaches to Learning

The research program at Lancaster sought to describe the

processes of student learning in relation to both relatively stable characteristics of the student (such as motivation and study methods) and the context of learning provided by academic departments (such as assessment and teaching methods). This program had grown out of a previous five-year study into the prediction of academic performance in higher education (Entwistle and Wilson, 1977). Part of that study involved the development of an inventory designed to measure motivation and study methods. The inventory had been intended to measure only a competitive form of motivation allied to 'need for achievement' in the academic context. Subsequent factor analysis (Entwistle, 1975) and interview analysis (Thompson, 1981) identified other forms of motivation - intrinsic, extrinsic, (vocational), social and fear of failure. The main study methods scale described ineffective management of time and effort (disorganized studying), and also included 'negative attitudes to studying'. An additional dimension investigated An additional dimension investigated in this study distinguished between syllabus-freedom and syllabus-boundness (Parlett, 1970). Syllabus-free students followed independent lines of studying, were involved in their own ideas, and were intrinsically motivated. Syllabus-bound students looked for clear guidelines and limited their efforts to the work specifically set. This dimension formed a bridge into a different conceptualization based on the processes of learning adopted by students.

Marton (1976; Marton and Saljo, 1976, 1984) used qualitative analysis of interview transcripts to identify the concept of 'approach to learning' among university students reading academic articles. The two categories distinguished

involved the intention to understand combined with a relational interaction with what was being learned. A surface approach brought together an intention minimally to fulfil task requirements with rote memorization. The main defining features are shown in Table 1.

It is important to draw attention to the way in which these concepts bring together intention and process. Although there may be arguments for maintaining a separation between these components, both empirically and experientially they prove to be difficult to separate. It seems to be valuable, therefore, in describing student learning, to keep intentionality to the forefront of the conceptualizations.

Pask (1976) identified two distinctive learning styles or processes, one with a broad focus (holist or comprehension learning) concerned with relationships between ideas and experience, and the other more narrowly focused on the topic with an emphasis on evidence and logical relationships (serialist or operation learning). The distinctive features of these concepts are also shown in Table 1. There is some evidence (Entwistle, Hanley & Ratcliffe, 1979) that first-year students, at least, rarely combine these processes in the way necessary to achieve full understanding of academic material (Entwistle & Ramsden, 1983). Extreme reliance on one or other of these two learning styles leads to equivalent pathologies of learning. Pask (1976) described as 'globetrotting' the tendency of holists to be over-ready to see similarities between ideas, and as 'improvidence' serialists' failure to recognize useful analogies.

The qualitative research of Miller & Parlett (1974) introduced the concept of 'cue-consciousness'. Some students

were found to be acutely alert to cues relating to assessment. They concentrated on how the lecturer presented the academic content, and took as much notice of presentation as they did of the content itself. Ramsden (1981) found that science departments tended not to give overt cues, but he accepted that some students in all departments showed what he called a 'strategic approach', with the intention of maximising their grades (see Table 1).

Operationalization of Motivation and Approaches to Learning

The research at Lancaster initially involved interviews with students to discover whether deep and surface approaches to learning could be identified in contrasting academic disciplines (English, history, economics, psychology, physics, and engineering) and across a range of academic activities (including essay-writing, reading, and problem-solving). Analysis of the interviews (Ramsden, 1981; Entwistle & Ramsden, 1983) confirmed the existence of these two main approaches in all the settings, and also identified the strategic approach.

While students' approaches varied to some extent from task to task, it was still possible to describe general tendencies towards one or other approach. Such consistency justified the development of self-rating scales to indicate the relative general strength of each approach. The interviews also provided a set of student comments which were used in conjunction with Marton's defining characteristics of approaches to provide a pool of items. In addition there were items, derived from previous interviews and inventories, which covered the differing forms of motivation, syllabus-boundness, study methods

and attitudes, and Pask's learning styles and pathologies.

Relationships between Motivation and Approaches to Learning

A 64-item Approaches to Studying Inventory was developed from two pilot versions, combining factor analysis and conceptual analysis to arrive at the final version (Entwistle and Ramsden, 1983). The sub-scales were grouped into four domains covering the three identified approaches and Pask's styles and pathologies. Internal reliabilites (Cronbach alpha) for the approaches were 0.79 (deep), 0.73 (surface), 0.70 (strategic), and 0.59 (styles and pathologies). Subsequent evidence of validity was obtained from relationships between inventory scores and interview categorisations (Watkins, 1983).

A national survey was carried out using the inventory with over 2,000 students. In factor analyses reported elsewhere (Entwistle & Ramsden, 1983), the sub-scales produced four related factors. The first two factors were clearly defined and represent combinations of approaches and styles with distinctive forms of motivation. The deep approach was closely associated with comprehension learning (holist) and intrinsic motivation. The surface approach was linked to syllabus-boundness, operation learning (serialist), improvidence, fear of failure, and less strongly to extrinsic motivation. The strategic approach was grouped with operation learning, but closer relationships were indicated with both achievement motivation and extrinsic motivation. The final factor brought together disorganized studying with negative attitudes and globetrotting. In subsequent work (Entwistle, in press, a) it has been recognized that the strategic approach takes two forms. One is strategic in relation to grading

procedures; the other is strategic in the sense of organized studying, making the most effective use of time and effort. It is not clear yet to what extent these are separable aspects of studying.

Since then shortened versions of the inventory have been used in schools and in higher education. In schools deep and surface approaches together with the 'organized' component of the strategic approach were identifiable, although with younger children the strategic merged with the deep approach. This factor structure was found in almost identical form in both British and Hungarian samples (Entwistle and Kozeki, 1985; Entwistle, in press, a).

In higher education 218 first-year students at Edinburgh University have recently been asked to complete a shorter inventory, together with a shortened version of Schmeck's (1983) Inventory of Learning Processes. Schmeck has developed his inventory from Craik and Lockhart's (1972) ideas on memory processes with sub-scales of deep processing, elaborative processing and fact retention, together with an indication of methodical studying. Principal components factor analysis with rotation to oblique simple structure produced four factors with eigen values greater than unity which explained 55% of the variance (Waterston, 1985). The simplified factor structure matrix is shown in Table 2, together with indicative loadings for two variables not included in the shorter inventory.

The four main factors in the Approaches to Studying Inventory were again clearly defined, and these corresponded closely with Schmeck's four scales. In Craik and Lockhart's terms it appears that a deep approach involves a combination of elaborative processing and the analytic component of deep

processing. The surface approach can be described in terms of a failure to carry out analytic thinking, as well as a reliance on memorizing. Surface approach again overlapped substantially with operation learning, as well as with both of Pask's pathologies. Disorganized study combined with negative attitudes to define the third factor, while the final factor brought together strategic approach with fact retention (which is itself closely related to achievement measures). Again there were clear motivational linkages established: deep approach and intrinsic motivation; surface approach and fear of failure; and strategic approach with both achievement motivation and extrinsic (vocational) motivation. Social motivation was associated with a disorganized approach to studying.

In independent work using a similar inventory, Biggs (1985; in press) has found almost identical linkages between approach and motivation, and has developed a model of student learning which depends on strong links between motives, strategies, and performance.

Contextual Effects on Approaches to Learning

Ramsden (1981) interviewed 57 students at Lancaster University and used a form of rigorous qualitative analysis similar to that described by Marton and Saljo (1984). The interviews were read through as a whole to identify comments specifically relevant to the research questions. These comments were then analysed in an iterative fashion to establish the main categories of description. The meaning of the categories was finally established in terms of a range of carefully chosen extracts. Following this procedure Ramsden was able first to establish 'deep' and

'surface' categories of approach to learning. In the interviews students had been asked to explain any differences in the approach they had adopted, between departments, between lecturers, or between tasks. He was thus able to establish categories which represented the students' attributions of causality for their approaches. In the original analysis each category was fully described in terms of its defining extracts. Here there is space only to provide a flavour of the students' comments.

It seemed that a deep approach depended on adequate previous knowledge (in science) or interest (in the humanities). In terms of the learning context, the approach adopted seemed to depend crucially on the assessment procedures, but also on workload, freedom in learning and good teaching.

> "(For short-answer tests in psychology.) I hate to say it, but what you've got to do is have a list of the facts; you write down ten important points and memorize those, then you'll do all right in the test ... If you can give a bit of factual information - so and so did that, and concluded that - for two sides of writing, then you'll get a good mark."
>
> "(For essays on history.) If I have started in plenty of time, then I do start thinking about the subject itself ... but basically it's all a bit of a struggle, just to hand things in, as opposed to being interested; you're working against a time deadline instead of for your own benefit."
>
> "(With freedom in choosing what to study) you're obviously interested in what you're doing. Therefore you're in a much more relaxed mental state for

approaching work."

"I'm really good at and enjoy (the subject) but that's only because a particular tutor I've had has been so enthusiastic that he's given me an enthusiasm for it and now I really love the subject."

Ramsden (1981) also developed a Course Perceptions Questionnaire out of the interview comments. This questionnaire was given to the same national sample which had completed the Approaches to Studying Inventory. It was thus possible to investigate by quantitative analysis the contextual factors influencing approaches to learning. The mean scores of students in a department on 'deep' and 'surface' approaches represented two dependent variables. The independent variables were the mean scores on the contextual variables, in other words the students' overall perceptions of that department. From analysis of covariance and from discriminant function analysis, it was found that good teaching, combined with freedom in learning, was strongly related to deep approaches in that department's students (Ramsden & Entwistle, 1981). Similarly, a heavy workload and a lack of freedom in learning were associated with high 'surface' scores. Good teaching was also linked to positive attitudes among the students, but not with the levels of achievement motivation or organized study methods, both of which seemed to be less susceptible to departmental influence (Entwistle & Ramsden, 1983).

Subsequent quantitative analyses elsewhere have confirmed that teaching methods and assessment procedures in contrasting medical faculities (problem-centered vs. conventional) are strongly associated with approaches to learning and time allocation (Newble & Clarke, in press; Newble & Jaeger, 1983).

Similar effects have also been demonstrated in relation to different assessment procedures in the social sciences: written assignments elicited deep approaches, while multiple choice and short-answer questions were associated with reproductive (surface) approaches (Thomas & Bain, 1984), although most students used both processes to some extent.

Good Teaching and the Eliciting of Understanding

In the interviews, good teaching was described in terms of a lecturer's ability to pitch material at the right level, maintain an appropriate pace, and provide a clear structure. Relationships with students were also seen as important, particularly in anticipating potential difficulties, and in providing sympathetic and ready feedback on submitted work or help with problems. But above all, in relation to a facilitation of deep approaches to learning, students drew attention to their experience of striking explanations, and of the lecturer's enthusiasm. For example, a physics student recounted how:

> "Recently we were doing Fourier analysis, and the lecturer mentioned in passing that it was something which they used when they transmit moon pictures back to earth ... Another example he quoted was about how when you bang a drum you get lots of different sounds rather than when you, say, play a violin you just get one note ... he said, if you look at this you can see why - and he was right, you could see why; it did make sense" (Ramsden, 1984, page 145).

Striking illustrations seem to help students both to share the lecturer's enthusiasm vicariously and, in some instances,

to shift both conceptions and approaches to learning. A detailed study of students' experiences of lectures led Hodgson (1984) to conclude:

> "Vicarious experience of relevance can ... be viewed as providing a bridge between extrinsic experience or a surface approach and intrinsic experience or a deep approach, ... to go beyond the outward demands of a learning situation and make connections between the content of the lecture and their understanding of the world around them" (page 102).

Lecturers thus play a crucial role, not just in transmitting information efficiently, but also in transforming ways of learning which would otherwise prevent personal understanding being attempted, let alone being achieved.

Perceptions of Learning Tasks and Learning Contexts

Diana Laurillard (1984) has reported an interview study into how students tackled a problem set by lecturers. Students had been required to write a device control program for a given microprocessor. The students commented on how they had set about the task.

> "I read through the questions to see what was familiar from the lecture - (you know), phrases or specific words which were repeated."
>
> "I have to sort through the wording very slowly to understand what he wants us to do."
>
> "I read through with reference to the class notes making sure I understand the sequence."

Laurillard's study showed that the students' attention "is focused not on the program to be written, but rather on what

they think the teacher requires." In other words, it is the students' perceptions of the task requirements which affect the way the problem is tackled. And the task requirements are viewed as much in assessment, as in academic, terms.

Another study shows the effect of perceptions of the environment within controlled experimental conditions. Fransson (1977) investigated the extent to which approach to learning could be influenced by manipulating the learning context. He was interested in the effects of relevance and anxiety. Relevance was varied by choosing an article which described proposed examination changes in an Education department, and asking samples of students from Education and Sociology departments to read it. The conditions were also varied to create contrasting relaxed and threatening situations. The hypothesis being tested suggested that relevance and relaxed conditions would be associated with deep approaches to the reading. The initial analysis showed no statistical significance. But the students had also been asked, after completing the reading, how relevant they had found the article and the extent to which the situation had seemed threatening. The reanalysis in relation to the perceived conditions showed the expected relationships.

Combining Qualitative and Quantitative Findings

In bringing together the findings from this range of studies it is crucial not to give unjustifiable weight to the quantitative results on the basis of their greater objectivity and apparent precision. In the context of this research, they are used to indicate patterns of relationships between concepts which can then be taken in conjunction with similar patterns

emerging from the analysis of students' comments on their experiences of studying. The quantitative findings indicate the generalisability and the relative strength of the relationships. The qualitative findings clarify the conceptualisation and illuminate the nature of the influences affecting student learning. Taken together, the effects on approaches to learning of motivation and perceptions of the learning environments can be described with some confidence.

The task presented by the lecturer is perceived by the student in terms of potential relevance on the one hand and of task requirements on the other. There appears to be a tension between these perceptions, analogous to the tension between visual and acoustic perceptions of the surroundings. Concentration on one pushes the other into the background. Thus if a student finds the material interesting or if relevance is demonstrated by the lecturer, intrinsic motivation is aroused and the approach becomes deep - if other conditions are favourable (e.g. previous knowledge, time available). In contrast, if the task requirements are at the forefront, the task being seen as an external imposition, then the dominating motivation becomes fear of failure, and a surface approach is more likely. If the student is more concerned with competition or academic self-esteem, then achievement or vocational motivation leads to a strategic approach, with an emphasis on efficient time management. A deep strategic approach would seem to be what most lecturers would endorse, but on its own the strategic approach focuses attention on the organizational aspects of studying, and again away from the subject matter itself.

The combination of quantitative and qualitative findings

also enables a provisional map of contextual influences on student learning to be drawn. Bringing together results from a wider set of studies reported elsewhere (Entwistle & Wilson, 1977; Entwistle & Ramsden, 1983; Marton, Hounsell & Entwistle, 1984) a heuristic model of the teaching-learning process in higher education is being developed (Figure 1). The positioning of the concepts, both horizontally and to a lesser extent vertically, suggests associations, either empirical or logical, in ways described elsewhere (Entwistle, in press, b, c). The model is intended to help both lecturers and researchers to recognize the ways in which individual differences affect perceptions, and how perceptions of the learning environment influence the processes and strategies used by students. Researchers are enabled to see their more focused studies within a broader context, while lecturers are encouraged to consider the likely interactions between departmental policies, the identifiable features of good teaching, and the individual characteristics of students.

The model is also being used as a conceptual framework to guide the development of an interactive computer-based simulation game intended to help students anticipate the experiences and study requirements of higher education (Entwistle, Odor & Anderson, 1986).

Conclusions

Qualitative analyses of students' reports of their experiences of learning have produced the concept of approaches to learning which includes in its definition both intention and process. The strong empirical links of the three distinguishable approaches with characteristic forms of

motivation reinforces the view that, both experientially and empirically, the learning processes of a student need to be considered in conjunction with motives and intentions.

Both quantitative and qualitative analyses drew attention to the relationships between the approach to learning adopted by the student and certain aspects of the learning context. Approach is strongly influenced by assessment and also by workload, freedom in learning, and what is perceived as good teaching. The quantitative analyses show the statistical certainty of these relationships, while the qualitative analyses clarify the ways in which these influences affect students.

By measuring the perceptions of a whole class, it is possible to obtain an index of the learning environment provided by a lecturer or a department. But it is also crucial to recognize that perceptions are essentially individual, depending on the student's own ways of inter- preting elements in the environment. It is suggested that the adoption of a deep or a surface approach may depend on competing perceptions of relevance in the content (often enhanced by the lecturer) and of task requirements. In universities and colleges a student's focus of attention is pulled away from a concern with personal understanding by the task instructions given by the lecturer and by the organizational requirements of competing demands, both academic and social. Qualitative investigations of student learning have maintained a research focus broad enough to provide realistic descriptions of studying in its everyday context (Harton et al, 1984).

The heuristic model which has been developed from the conjunction of qualitative and quantitative findings is

intended to focus the attention of both lecturers and researchers on the features, both individual and environmental, which interact to influence learning in universities or colleges. This set of complex interactions also seems to exist, in a modified form, in schools (Entwistle, in press, c). It is suggested that this heuristic model will not only suggest fruitful fields for future research, but will also provoke practical innovations by teachers.

One important advantage in deriving the descriptive categories from experiential reports is that the findings are readily communicable. Students and teachers accept the descriptions as 'recognizable reality' and so the findings, and implications deriving from them, strike an immediate chord (Entwistle & Ramsden, 1983; Hounsell, 1984). The communicability of research findings, and the fertility of concepts and models in pedagogic terms, are all too often ignored by researchers. By retaining a broad focus, by giving due weight to intentions and perceptions, and by strengthening the communicability of findings, qualitative research offers important complementary strengths in investigating teaching and learning.

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Table 1

Defining Features of Learning Approaches and Styles

Deep Approach
Intention to reach personal understanding
Vigorous interaction with content
Relate new ideas to previous knowledge
Relate concepts to everyday experience
Relate evidence carefully to conclusions
Examine critically the logic of the argument

Surface Approach
Intention merely to complete the task as set
Task treated as an external imposition
Unreflectiveness about purpose or strategies
Identify discrete elements needed for tests
Memorize those elements without integration
Failure to distinguish principles from examples

Strategic Approach
Intention to obtain highest possible grades
Gear work to preferences of teacher
Awareness of marking schemes and criteria
Use previous exam papers to predict questions

Organize time and effort to greatest effect
Ensure right conditions and materials for study

Comprehension Learning Style
(in extreme form becomes Globetrotting)
Broad focus of attention across whole topic
Use of analogy, illustration and anecdote
Personalize incoming information
Relate new ideas to previous knowledge
Relate concepts to everyday experience

Operation Learning Style
(in extreme form becomes Improvidence)
Narrow focus on immediate step of task
Preference for well established procedures
Concern with accuracy and precision
Relate evidence carefully to conclusions
Examine critically the logic of the argument

Table 2 Factor Structure of Approaches to Studying and Learning Processes Inventories

Scales	Factors I	II	III	IV
Deep Approach	.83			
Comprehension Learning +	.55			
Elaborative Processing *	.81			
Intrinsic Motivation	.79			
Surface Approach		.77		
Deep Processing *		-.73		
Operation Learning		.66		
Syllabus-Boundness +	-.41	.58		
Fear of Failure		.76		
Strategic Approach			.61	
Fact Retention *			.61	
Achievement Motivation	.36		.45	
Extrinsic Motivation			.57	
Disorganized Study Methods				.82
Methodical Study *	.37			-.83
Negative Attitudes to Study	-.46	.36		.38
Globetrotting		.52		
Improvidence		.69		
Social motivation				.67
Eigenvalues	3.74	2.55	1.86	1.07
Percentage of extracted variance	21	14	10	6

Note This Table is derived from two analyses (N = 2208; 218), with loadings less than |0.35| omitted. Loadings are derived from the smaller sample with which both inventories were used, except for the two scales marked '+'. These scales were excluded from the shorter inventory given to the smaller sample.

Intercorrelations between factors		II	III	IV
	I	-.17	.16	-.14
	II		.35	.27
	III			-.13

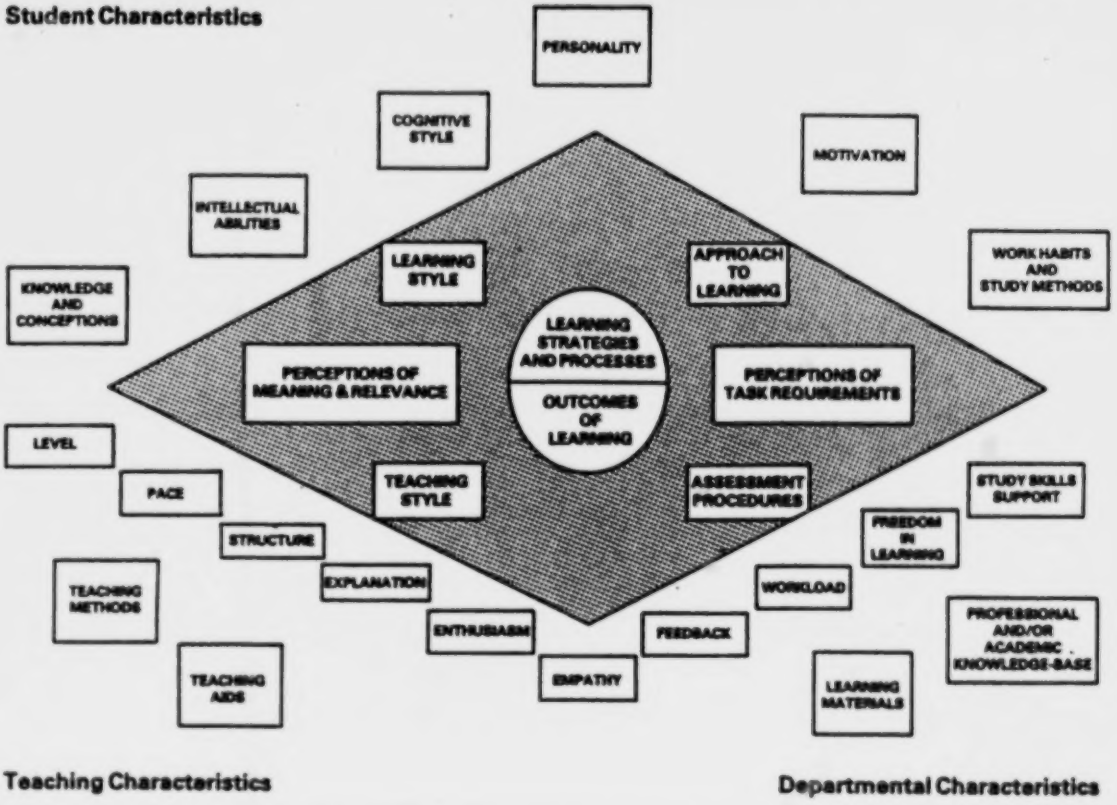

FIGURE 1 A HEURISTIC MODEL OF THE TEACHING LEARNING PROCESS IN HIGHER EDUCATION